



PROTECTED DESKTOP ACCESS BASED ON USE OF MOBILE PHONE

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ABSTRACT

Due to the complicity of the nowadays life, people need to do several things at the same time in work, at home. This can be done only if personal resource can be accessed securely where they are located in computers at home or in office. This paper presents an algorithm of accessing securely a desktop computer (DC) at home remotely to perform some tasks using a mobile phone (MP), transferred tokens were protected by use of RC5 encryption code. The obtained results show that proposed algorithm can be applied to perform tasks to help people in work or at home simultaneously.

KEYWORDS: MP, remote DC, resource access, RC5.

1. INTRODUCTION

There are plenty of reasons to have a remote control for your computer. Maybe you need a way to access your files from outside your home, or you use your system without a monitor, or you want an easy way to control a home DC without a mouse and keyboard cluttering up your coffee table [1]. Either retrieve or backup files located at home or in office.

Practically, there are two general ways to achieve remote control. One way is to use a full remote desktop client, which will transmit files from your monitor to your phone or tablet. This option is generally more powerful, but it's also a bit more complicated[5], and is preferred by more advanced users. Second way, is a standard "mouse and keyboard". It is working more or less like a TV remote control for your DC. For all of them you'll need an active connection on the local network (preferably Wi-Fi, but you can connect your computer to the router via Ethernet) and to secure your transaction [4].

In commerce, there are several applications to control your DC remotely such as a "TeamViewer". It is a powerfully program that can easily install and use to control a DC remotely. It can be use with android to transfer files between DC and MP it works over 3G and 4G as well as Wi-Fi [2].

A DC can be controlled remotely by configuring router's page. Most recent remote DC clients offer control over the Internet as well [3].

Researches regarding this subject are either accessing remote MP or accessing remote DC using MP [8]. In last few years two important researches have done. First is by Mule O. el al. (2016) to access remote MP using a DC. Second is by Bharathi J. C. and Rao T.Y.S. (2012) in accessing a remote DC using MP. In the first research, cellphone was accessed remotely using a DC. The project uses a DC which is considered as server to connect a client android remotely. An application is used to monitor and control android smart phone remotely, so user will be able to retrieve all his calls and messages remotely [6].

In the second research a DC was accessed remotely with help of android MP, the process is based on use of virtual network computing. A server was created on a DC and with use of a Wi-Fi network connection, a MP as client can be connected. An image of the DC is compressed then sent to the cellphone. Short functions are used to access area in the DC it works like a TV [7].

To communicate or to access sensitive information, there are a number of security algorithms that can be used to protect your data before sending it over transaction among them RC5 algorithm. Such algorithm can be used to encrypt data to protect it from an unauthorized use [9].

Based on the above, DCs can be controlled remotely, in this study will focus in send messages from a MP to a remote DC to perform some helpful tasks to kids as well families at home then receive a performance acknowledgement and provide them security as well.

2. METHODOLOGY

Components used by the proposed system hardware and software are explained in the following paragraphs:

2.1 The system

1. User uses his mobile phone (MP) via SIM1 send a message to a remote Desktop computer (DC) through SIM2, using local MP coverage.

2. The received message is to be checked whether it is a true message or false message

True Message

- a. Software in DC was prepared to load an action based on value of received message and perform proper action.
- b. Once action is performed an ACK of finishing action is sent to the SIM₁ through SIM₂
- c. Go to 3

False message

- a. An ACK of wrong message is sent to the SIM₁ through SIM₂
3. Next: new message? Yes or No
 4. Yes: Go to 1
 5. No: Go to 6
 6. END

Fig (1) shows a flowchart of the proposed system.



Fig. 1. Flowchart of proposed system

2.2 System Configuration

The proposed system as in Fig 2, consists of a remote DC, with an integrated SIM card denoted by SIM₁, a MP configured with SIM card denoted by SIM₂. A software program written in VBasic language used to explain messages that received by SIM₂ to perform a suitable action, then the DC return an ACK to SIM₁ waiting for new message.



Fig. 2. Equipment of proposed system

Fig. 3. shows messages exchange between remote DC and a MP, messages are exchanged through SIM cards integrated in both systems, the MP send a message were remote DC return an ACK.



Fig. 3. Messages exchange between remote DC and MP

2.3 Message configuration

Messages to be send from any HP have to be configured first in the proposed system. Few messages are chosen for testing noting that any type of message can work. Menu of configuring the system is shown in Fig. 4. Message id, command and descriptions have to give to the system.



Fig. 4. Message configuration by proposed system

2.4 MP(SIM₁) connection to Remote DC(SIM₂)

The MP was integrated with the SIM₁, it works in any local coverage, simply information such as dial Remote DC number, message id, the command type for selected message and its description will be shown. Fig. 5. shows sending message menu by the MP. Message is directly sent to the Remote DC.

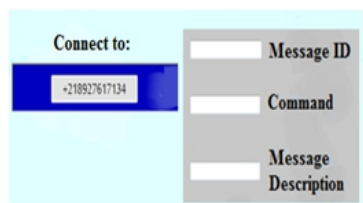


Fig. 5. Message to be send by MP

2.5 Message receiving by remote DC (SIM₂)

The remote DC with an integrated SIM₂ card, it can receive a message and store it into a directory prepared for that proposes, that is if and only if the remote DC (SIM₂) is within the local coverage.

2.6 Message Loading in remote DC (SIM₂) directory

A program written in VBasic is used to load a received message and consult a database to select the suitable action. Instruction are written in a VBase code and fill into a data base, each instruction was numbered, once the received number matches the database an action is taken by the remote DC. Actions are numbered (01 to 07). Remote DC peeps if it receives a message code equals to "06". To perform action reset DC, the received message must be "01" and so on as described in Table 1.

Table 1. Messages and corresponded instructions

No.	Message	Description
1	01	Reset pc
2	02	Run game
3	03	Control panel
4	04	Note pad
5	05	Run Calculator
6	06	peep
7	07	Display Time

2.7 ACK to MP of action performance.

Any received message must have its corresponding in data base that easily helps in performing proper action by the remote DC. Then an ACK of performing the

required action have to be sent to the MP (SIM₂) and displayed on its screen.

2.8 ACK to MP of wrong choice

In case a DC (SIM₁) receives an invalid message which means receiving any text or number which is not in database an ACK of wrong message is prepared and sent back to MP (SIM₂).

2.9 Data Protection

Data transferred between DC and MP have to be encrypted when it sent and decrypted at time it received, hence the proposed algorithm uses RC5 for encryption/decryption of data. In MP a pair of public key is produced (public key and private key), then send public key to the remote DC. Remote DC uses it to encrypt the RC5 secret key and send it to MP. MP decrypts the received key and uses it for any further encryption/decryption between them.

To avoid an authorized access, each command sent by MP to DC is encrypted with a shared key between the two parties and using RC5 algorithm. A replay is received using same procedure. Noting that with use of symmetric encryption algorithm will protect data and won't delay the system.

3. RESULTS

Testing the proposed system it gives good results. As mentioned in the previous paragraph the received is load in the directory and a written program is consulted to select the proper action. As shows in Fig. 6, the remote DC (SIM₂) received a message with value "05" from MP (SIM₁) which means run a calculator.

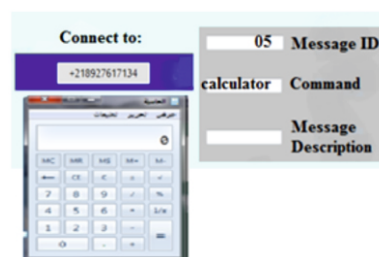


Fig. 6 running the calculator in remote DC

Similarly in Fig. 7, message with value "04" was received by the remote DC (SIM₂) sent by the MP (SIM₁) then it displays the control panel as shown.



Fig. 7. Displaying control panel by remote DC

Another message was shown by the remote DC (SIM₂). It shows a note pad as in Fig. 8.

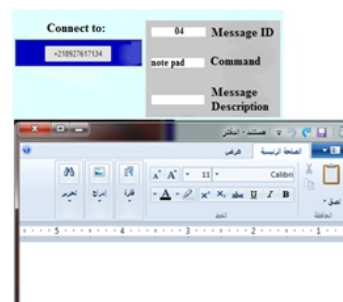


Fig. 8. Displaying note pad by remote DC

4. RESULT ANALYSIS

As shown in results it easy to invoke a remote DC where it was located in office at home to copy to do some work and no need to use internet to do so, just use the MP with a local coverage to perform certain work. Results shows among hundred messages, the proposed system recognizes ninety seven of them were by the remote makes 97% were as shown in the field correct and recognized (CR) in the

Table 2 and only 3 messages did not recognized due to distortion caused by bad coverage. Table 2, shows performance results obtained by the proposed system.

Table 2. Proposed system Acceptance and Rejection

No.	MT	NM	R	NR	CR	WR
1	DT	50	49	1	98%	2%
2	ST	50	48	2	96%	4%
3	TM	100	97	3	97%	3%

Where :

MT message type, NM number of messages, R recognized, NR non recognized, CR correct and recognized, WR wrong not recognized, DT different type, ST same message and TM total messages.

5. RELATED WORK

The idea of this work is similar to the work provided by [7] and [8] that is accessing a remote desktop computer using hand phone. The mentioned works use a Wi-Fi network in establishing a connection between the DC and MP, where in the proposed system uses local MP coverage and this gives the proposed system an advantage in enhancing the mobility by increasing the access range and secure data transaction between two parties.

6. CONCLUSION

A secure system of accessing a remote DC using a MP was presented main while paper investigates similar systems. Paper also shoes how to secure messages sent to the DC remotely.

REFERENCES

1. Nield D.(2012). How To Control Your Computer With Your Phone. <http://gizmodo.com>.
2. Rhee E.(2011).How to control computers remotely with your Android phone <http://www.cnet.com>
3. Garnett A.(2013). How to control your PC with your Android phone. PC World <http://www.pcworld.com>
4. Crider M.(2015). Use your PC from the couch – or anywhere – with these smartphone apps. <http://www.digitaltrends.com>
5. Taichung C. Y, and Kou M.(2005). Remote monitoring and control of PC clusters using mobile phones with J2ME. 3rd International Conference on Information Technology: Research and Education.
6. Mule O, Shaikh N, Shinde P, Wagaskar A, Ramteke S.(2016). Remote Access of Android Smart Phone. International Journal of Computer Science and Information Technologies, Vol. 7 (2) PP 711-714.
7. Bharathi J. C. and Rao T.Y.S. (2012).Remote computer access through Android mobiles. International Journal of Computer Science Issues, Vol. 9, Issue 5, No 3.ISSN (Online): 1694-0814.
8. Bhandari K. S., Mandole V. B., Sachin B. Munde T. A. D. (2015). Remote Desktop Access through Android Mobiles and Android Mobiles Access through Web Browser. International Journal of Computer Science and Information Technology Research ISSN 2348-120X. Vol. 3, Issue 1, pp: (369-373).
9. Elmadani A. B.(2013).Multiple layer security in protecting Arabic-unicode sensitive information based on stenography and cryptographic algorithms. Proceedings of the second International Conference on Informatics & Applications (ICIA2013). Vol. No. 1. Pp 19-23. Lodz Poland. ISBN: 978.1.467305255.0©2013IEEE.